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ABSTRACT

Teacher education programs for physical education teachers have deemphasized the subject matter of physical education and instead have defined the profession in terms of the methods, processes, and procedures of pedagogy. Among the many reasons for this change in emphasis is the belief that generic information processing skills can be acquired without concern for content or subject matter. In particular, it is thought that general problem solving, thinking, and reasoning skills can be learned and then applied to any domain of knowledge no matter how different or complex. A review of the research in the physical education and teacher education fields is presented, showing that the deemphasis on subject matter in the preparation of physical education teachers is not supported by the literature on cognition. It is concluded that it is not a tenable assumption upon which to base the education of teachers, whether at the undergraduate or graduate level. A three-page list of references is included. (CB)

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The Role of Subject Matter in the Preparation of Teachers in Physical Education

by

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INTRODUCTION

Beginning with the first session on the first day, the recurring theme in the symposium has been about the characteristics, tensions and concerns that appear to exist between the disciplinary groups in physical education and the professional groups - the teacher educators, sport managers, exercise leaders and others. In my presentation this morning I want to explore what I consider to be one of the underlying reasons for this separation as it has occurred between the disciplinary, knowledge generation groups in physical education and those responsible for the education of teachers in our schools.

First, I will show that in teacher education programs we have indeed de-emphasized the subject matter[1] of physical education and instead have defined the profession in terms of the methods, processes and procedures of pedagogy. Second, although the reasons for this state are both numerous and complex, only one is presented, a reason rooted

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1. By subject matter is meant the information that is taught by teachers in the schools, information about the skills and strategies of activities, the science of movement, the anatomy, kinesiology, biomechanics, the dimensions of fitness, the psychological, historical and sociological-cultural aspects of physical activity and sport.

in the early years of cognitive science. One of the earliest assumptions of cognition (during the early 60's) was the belief that generic information processing skills could be acquired without concern for content or subject matter. In particular, it was thought that general problem solving, thinking and reasoning skills could be learned and then applied to any domain of knowledge no matter how different or complex (Browne et al, 1979; Glaser, 1984; Gardiner, 1985).

I will show that in teacher education we have separated ourselves from the subject matter, the content of physical education because of the belief that generic teaching skills could be acquired and applied to any subject area, generic teaching skills that have their roots in the early assumptions of cognition. Finally, I will show that this is a position that is no longer supported by the literature in cognition nor is it tenable as an assumption upon which to base the education of teachers, whether at the undergraduate or graduate level.

THE DECLINE OF SUBJECT MATTER EMPHASIS IN TEACHER PREPARATION

But first what evidence is there to show that teacher education programs in Physical Education are indeed largely process or procedurally oriented? A strong indicator of this claim exists in the literature that the teacher education community has produced over the past ten years - in our articles, textbooks, dissertations and curricular models. I first carried out an informal review of the articles in the Journal of Teaching Physical Education (since 1982). In total, 58 articles in twelve randomly selected issues were

analyzed. The objective of the analysis was to categorize each article as being either a) knowledge or subject matter driven or b) process or procedurally driven. In classifying an article as subject matter oriented or process oriented, the declarative-procedural distinction commonly used today in cognition and in education was adopted (Anderson, 1980; Glaser, 1976, 1984). The terms declarative and procedural evolved during the mid seventies and are two terms that describe how complex bodies of knowledge are stored in memory (Winograd, 1975). A duo-representation model is now widely used in which declarative knowledge is defined as the facts of a subject area, the data and concepts that make up a domain of knowledge. Procedural knowledge is defined as the processes and procedures one acquires in order to use facts, concepts, and data appropriately.

An article was classified as declarative if the focus of the work was on showing how content or subject matter in physical education could be taught. An article was defined as procedural if it was directed primarily toward the processes of teaching with no reference to subject matter. Of the 58 articles reviewed only three articles presented declarative knowledge as a key element; approximately ten presented a combination declarative-procedural focus with the remaining 42 articles being procedural in nature.

More extensively, Maurice Peiron (1986) carried out an investigation of research on the observation literature in the teaching of physical education, a major focus of research in teaching physical education over the past ten years. Categories of research analyzed were

teacher-student interaction, teacher behavior, teacher behavior modification, student behavior, process-product studies and coach behavior. He identified 216 pieces of work produced before 1984, and concluded that 60.2 percent of the studies did not provide the reader with enough information to identify the subject matter taught.

Finally, the focus of teacher education can be analyzed by looking at the curricular models currently recognized in physical education. In the past five years a number of authors have shown how physical education in the schools has become a multi-model field. Lawson and Placek (1981) define five (5) models (the traditional, fitness, lifetime sports, humanistic, and alternate); Bain and Jewett (1985) describe seven (7) (developmental, humanistic, fitness, movement education, kinesiological studies, play education, personal meaning). Seidentop, Mand and Taggert (1986) outline six (6) (multiactivity, fitness, sports education, wilderness sports and adventure education, the social development model, the conceptually based model, and the informal curriculum). Allowing for duplication, there appear to be ten distinctly different models in use in our schools today. And of the ten models identified, eight are largely procedural or process models. Although all of the models mention subject matter, the content of school physical education is not presented so that a stranger to physical education or a beginning teacher could identify what a child should learn in each grade, as would be evident in a math, or science, or language arts curriculum.

This trend away from the subject matter of schooling and to an emphasis upon the processes and procedures of teaching is not unique to physical education. Indeed it is a problem in all of teacher education. A recent article by Shulman (1986) describes the universality of the problem.

> In reading the literature in teaching, it is clear that central questions are left unasked. The emphasis is on how teachers manage their classrooms, organize activities, allocate time and turns, structure assignments, ascribe praise and blame, formulate the levels of their questions, plan lessons and judge general student understanding. What we miss are questions about the content of the lessons taught, the questions asked, and the explanations offered. How do teachers decide what to teach, how to represent it, how to question students about it and how to deal with questions of misunderstanding? ... Research on teaching has tended to ignore these issues (Shulman, 1986, p.8).

AN UNDERLYING REASON

One of the underlying reasons that teacher education has taken on a procedurally oriented focus may be grounded in the definition of and early assumptions of cognitive science. During the early sixties, cognitive psychology emerged as the dominant science informing us about how people acquire knowledge and use it in different settings. An early assumption of cognition was that generic information processing skills could be defined independent of content or context (Gardner 1985). Tremendous energy was devoted to discovering general process skills that once mastered were thought to be applicable to any subject area, no matter how complex or different (Bourne et al, 1979).

The education community understandably adopted this idea as it appeared that a body of pedagogical knowledge could be defined without concern for the subject disciplines. Teacher education programs could be created that taught people how to learn, how to solve problems, how to deal with change, how to think and reason. Once taught how to be creative or think logically then these were abilities applicable to any subject area and therefore useful to the individual throughout their lifetime (Glaser, 1984). As a consequence, in teacher education, we have defined a field in which the majority of our time is spent teaching recruits process skills - strategies or methods on how to plan and deliver lessons, how to vary teaching style, develop effective management techniques, how to use time, how to control a class, how to provide feedback and provide reinforcement, how to practice good management skills, how to be a positive interactor.

Although these are important skills and necessary in the education of teachers and teacher educators, they should not constitute the whole of the definition we have for the teaching field. One of the main reasons we can no longer retain this as our emphasis is because the literature in cognition no longer supports the notion of generic processing skills especially when complex subject matter must be acquired. Glaser (1984) provides an excellent review of research in education showing that generic problem solving, thinking, reasoning skills do not have the power and transferability that was once thought. Programs designed to teach strategies for thinking, or problem solving are effective only under limited conditions - specifically when the material to be learned lacks complexity, or when it has a common sense quality or when what is being taught possesses a natural structure that is readily apparent to the learner or in truth teaches itself. By presenting teacher education programs that are largely process oriented we may be unwittingly limiting the extent to which teachers can deal with and teach complex information.

Perhaps some of the most convincing evidence for the limitations of generic processing skills is in the artificial intelligence community where for two decades, just as in education, an attempt was made to describe (using a computer however), how people think and solve problems. Early attempts in AI avoided knowledge in the interests of simplicity - the general idea was to program a computer with problem solving algorithms that were so all encompassing as to be content free (Dehn and Schank, pp.373, 1984). Two things have been learned from this effort. First, the extent to which a computer can emulate human

processing skills is dependent upon how rich the computer's knowledge base is in the first instance. Second, once the computer is provided with declarative knowledge in combination with procedural, then it shows a remarkable ability to function like an expert, emulating the thinking and problem solving skills of experts in many fields - doctors, geologists, lawyers and engineers (Peat, 1985).

Over the past five years there has been a growing body of literature in education and physical education showing the importance of declarative and procedural knowledge and how they combine to produce learning, superior performance and expertise. Works that reflect this by Larkin (1983), Glaser (1984), Leinhardt and Smith (1985), Shulman (1986), Housner and Griffey (1985), Rink (1983), Berliner (1985) and many others show how teacher content knowledge impacts upon teacher process, practice and effectiveness.

What then does all this mean in the future of teacher education in physical education? Let me summarize what has been said so far. One, we appear to be a field increasingly divided into two bodies - one that pursues the discovery of knowledge for its own sake - the disciplines, and the other that applies knowledge in various ways - as professional teachers, exercise leaders, sport managers. Two, the teacher education literature of the past ten years shows that we have increasingly devoted ourselves to the processes and procedures of pedagogy and have not given the subject matter or disciplinary information of physical education similar consideration. This is a universal problem in education and not unique to physical education.

Three, a possible reason for this development is found in an early assumption of cognition that sought to identify generic information processing skill that were thought to be effective in all situations, including teaching. Fourth, the literature in cognition and education has now changed and is saying quite clearly that if we want our student teachers to be skillful professionals then we must combine knowledge of subject matter with the processes of pedagogy. In order to do this we must somehow re-negotiate the gap between the disciplines and those in pedagogy who are responsible for how physical education is to be taught in our schools.

Taking these points into consideration, four concluding suggestions/observations are offered. One, those in the pedagogical community should be aware of the newer literature that shows that skill and competency and expertise in teaching must allow for the interaction between knowledge of the subject matter and the processes/procedures of teaching. Two, those in the disciplinary fields need to accept as part of their responsibility the need to articulate what is valuable in their discipline that children in our schools should know or be able to do. Instead of limiting their involvement to a few highly specialized adult students they need to embrace issues related to the teaching of school children as part of their responsibility as scholars and leaders in their areas. Three, the pedagogical and disciplinary fields need to combine their efforts to produce a clearer definition of what school physical education is and how it should be taught. One of the vehicles whereby this may

occur is in our graduate programs in teacher education. Graduate students working on their masters and doctoral degrees are reading the newer literature and therefore will express a need to work with specialists in pedagogy and specialists in the subject/discipline areas of physical education. The extent to which we, in both groups, are willing to accommodate their needs will be very important. If these students are encouraged to develop their theses and dissertations by accessing knowledge from both groups, they may serve as a bridge, a link that brings declarative and procedural knowledge together in conceptually sound ways.

Finally, we all need to re-assert and re-emphasize what "being able to teach" truly represents. It was Aristotle (cited in Shulman, 1986) who stated long ago that the ultimate bases of expertise is evident in those who can teach.

> We regard master-craftsmen as superior not merely because they have a grasp of theory and know the reasons for acting as they do. Broadly speaking, what distinguishes the man who knows from the ignorant man is an ability to teach, and this is why we hold that art and not experience as the character of genuine knowledge (epitome) - namely that artists can teach and others (i.e. those who have not acquired the art by study but have merely picked up some skill empirically) cannot. (p.7).

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